Workshop on Aquatic Life Criteria for Metals
Short Term Recommendations

These are the overall short-term recommendations of the experts invited to the Workshop on Aquatic Life Criteria for Metals held January 25-29, 1993 in Annapolis, Maryland. The group also recommended that the Agency should fund (or co-fund) some basic integrated longer term research to determine what controls the bioavailability of metals. A separate document will detail the long-term research recommended.

This workshop was organized by EPA, however, the following short-term recommendations were developed and submitted to EPA by the experts invited to the workshop. These recommendations should not be considered EPA's recommendations or policy. EPA is in the process of evaluating these recommendations and revising its national policy on metals.

This workshop explicitly excluded mercury and selenium from discussion because they bioaccumulate and their mode of action differs from most other metals.

The following short-term recommendations are meant to further implementation of the aquatic life criteria for metals.

I. Clean Analytical Chemistry

Most metals data have <u>not</u> been collected using appropriate clean techniques (both sampling and analytical). Consequently, values for effluents and receiving waters may be suspect and should be verified using appropriate clean sampling and analytical techniques. Metals concentrations in the low parts per billion range that have been collected in previous years have been shown to be unreliable due to various types of sample contamination. This may include effluents, as well as ambient water samples. Therefore, modern methods for clean (ultra-clean techniques for open ocean and lakes, clean techniques for all other water body types) collection, sample handling, and instrumental techniques should be used, and new effluent and receiving water data should be collected.

EPA HQ should prepare guidance for the States, regions, and dischargers to describe clean sampling and analytical laboratory procedures. Guidance should also be provided to permit writers on how to handle pending and previously issued permits (ie. how good is the analytical data that was submitted and is being submitted), and the relationship of clean techniques to existing Part 136 analytical methods and sample handling requirements.

IV. Water-Effect Ratio (WER)

The water-effect ratio is a biologically based method to estimate the bioavailable fraction of a toxic pollutant in a receiving water. Guidance for this method will be available shortly. The application of WER can be used as a substitute for the dissolved fraction by estimating the bioavailable fraction. For this use, both total recoverable metal and dissolved metal should be measured. If the criteria are expressed as dissolved, then a dissolved WER should be used. Use of a dissolved WER should reduce the dependence of the WER of suspended solids concentrations. If the criteria are expressed as total recoverable, then a total recoverable WER should be used.

V. List of under and over protective factors

EPA should prepare a list of the under and over- protective factors and assumptions in the standards-to-permits process as information for permit writers. This could serve to better insure that the criteria are applied to achieve the intended level of protection. The permit writer should consider both the over and underprotective factors in limits and in considering when a WER is appropriate. These factors and assumptions should at a minimum include:

A. Duration and violation frequency

B. Criteria (applicability of dissolved fraction)

C. Steady state versus dynamic modelling for TMDLs.

D. Permit limits and averaging periods.

VI. Organometallic compounds

There are classes of compounds, for example metalized dyes, that contain metals of concern. However, these chemicals may have characteristics that require additional consideration. Some metalized dyes are designed so that the metal is tightly bound, and they will not break down quickly. However, some treatment processes will enhance the breakdown of these compounds. If these chemicals can degrade rapidly, for example in the treatment plants, then these chemicals would convert to ionic metal, and would be handled as described in the above discussions. If, however, they are resistant to decay, then they should be evaluated as a separate class of chemicals, with specific properties. (It has not been determined exactly what procedures or criteria to use to determine resistance to decay.) Data presented demonstrating the bioavailability or toxicity of these compounds in the effluent should be used in developing permit limits for metal.